Łukasiewicz
Institute
of Non-Ferrous
Metals

Light Metal Centre offer

Division in Skawina
Piłsudskiego 19 street
32-050 Skawina, Poland
+48 12 277 88 32
oml@imn.lukasiewicz.gov.pl
https://imn.lukasiewicz.gov.pl/

Łukasiewicz – IMN, Division in Skawina, for 70 years specializes in studies of various casting technologies and other forms of light metals processing and surface treatment for the needs of basic R&D work carried out for the industry and other research centres.

The main scope of the activity of the light metal centre includes the technology development to prepare liquid metals for casting, casting of aluminium, aluminium alloys and magnesium alloys in ingots and billets, various processes of the plastic working of light metals, including extrusion, rolling, forging, drawing and stamping, manufacture of protective coatings on Al and Mg products, manufacture of new advanced materials based on light metals, and processing and disposal of waste.

Within the Centre there is an Accredited Laboratory of Physical Metallurgy and Chemical Analyses AB394, providing high-quality research services in the field of the analyses of physical and chemical properties of light metals.

The Center meets the requirements of the ISO 9001: 2015 standard for the Quality Management System and has Certificate No. 255791-2018-AQ-POL-RvA confirmed by DNV (Det Norske Veritas). The strong potential of the Light Metal Center at Łukasiewicz – IMN is underpinned by a highly specialized team of experts with long-standing experience in light metals research. The team has successfully acquired and implemented numerous national and international projects, including EIT RawMaterials initiatives, the RADIUS project, Horizon 2020 projects, SALEMA, and CORNET ALU4CEED.

AB 394

Laboratorium
Metaloznawstwa
i Analiz Chemicznych

Casting
- Preparing high-quality metal for standardized alloys casting and according to individual guidelines on a scale from laboratory 2kg to semi-industrial 850kg, - casting aluminum alloys billets for plastic processing in the diameter range from 100mm to 450mm, - casting magnesium alloys billets for plastic processing with diameters of 100mm, 170mm and 254mm, - fabrication materials by rapid solidification process with non-standard chemical compositions and properties, - Quality control of liquid aluminium and its alloys, and analysis and identification of the causes of defects in shaped castings.
Plastic processing
- Research and development of solid and hollow aluminium and magnesium alloys, single and multiport on horizontal 5MN, both direct and indirect, press with 3-zone

Łukasiewicz Research Network – Institute of Non-Ferrous Metals, HQ in Gliwice (44-100), Sowińskiego 5 street,
phone: +48 32 238 02 00 | e-mail:imn@imn.lukasiewicz.gov.pl | https://imn.lukasiewicz.gov.pl/
VAT ID: 631 020 07 71 | National Official Business Register no: 000027542 |
Waste Management Register no: 000011457 | National Court Register no: 0000853498, AE:PL-95885-52593-IARFB-18
Account at Bank PEKAO S.A., no: 48 1240 4748 1111 0000 4877 1906 PL
Account at Bank PEKAO S.A. no: 06 1240 4272 1978 0010 7391 3897 EUR

billet induction heater and online cooling with water, mist, air, press runway – 12m, feed diameter – 100mm, 90mm, 75mm,
- low-volume production of extruded profiles from Al and Mg alloys carried out on an extrusion line with a 5MN press,
- Research on the die-forging process of Al and Mg alloys on a vertical 2.5MN press with equipment. Hot or cold forging, possibility of inter-operational heat treatment,
- non-conventional extrusion line continuous rotary extrusion – Conform® MC-260,
- Additional tests: ultrasonic flaw detection, conductivity tests, video recordings using the ultra-fast camera, industrial thermography camera.

Surface Engineering

- Research and development in the field of chemical surface treatment and finishing of aluminum, magnesium and its alloys,
- study of the coatings properties on aluminium, magnesium and its alloys,
- metal coatings (nickel, Ni-SiC, Ni-Al_2O_3),
- conversion coatings,
- corrosion research of aluminium, magnesium and its alloys,
- scientific and technical services,
- anodizing services (up to 3,0 m),
- hard anodising (up to 1,9 m),
- corrosion tests in artificial atmospheres. Salt spray tests (NSS, AASS, CASS), Kesternich test, changing climate cycles, tests at reduced temperature up to – 40°C
- electrochemical corrosion test methods,
- measurement of coating thickness using eddy currents methods, culometric method and X-ray method,
- taber abrasion test methods,
- stress corrosion cracking tests (SCC),
- surface treatment and finishing of aluminum, magnesium and its alloys.

Materials Engineering and Chemical Analyses

- Structure analysis on LM/SEM with EDS and EBSD/TEM with HAADF and EDS,
- computer image analysis,
- measurement of residual stresses and retained austenite content,
- qualitative and quantitative X-ray phase analysis and textures,
- mechanical testing at ambient temperature in the force range up to 600 kN: static tensile test, compression test, bend test,
- mechanical testing at high and low temperatures in the force range up to 100 kN in the temperature range from -150 C to 1200 C,
- special technological tests in range up to 600 kN,
- Hardness measurements (Microhardness measurements) – Vickers (0,01-100 kG), Brinell (HBW 1/2.5 kG -HBW250 kG), Rockwell (60,100,150 kG) and Superficial Rockwell (15,30,45 kG), Knoop (1 kG),
- tear test (Khan test),
- heat treatment in furnaces (max 800x900x1200mm, 850°C, new 1000x1000x4000mm 650°C), including a salt furnace ([KNO_3 50-60%+$NaNO_2$ 50-40%) 15kW max 550°C) and dryers (800x1000x2500mm, max.300°C),
- quantitative analysis of the chemical composition of Al and Mg alloys by optical emission spectrometry and absorption spectrometry,
- determination of hydrogen content in metals and metal alloys (Al, Fe, Cu, Ti).

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